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PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION.

No. 28,159, A.D. 1932.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of "San Remo", Beverley Road, New Malden, Surrey, of British Nationality, and THE NORBITON POTTERIES AND BRICKWORKS LIMITED, a company organised under the Laws of Great Britain, of Blagdon Road, New Malden, Surrey, do hereby declare the nature of this invention to be as follows:—

5 This invention relates particularly to a process of applying sand or sand and/or colouring matter to the surfaces of bricks, building blocks slabs or the like, such bricks or the like being known commercially as "semi-dry". Such bricks have surfaces which are hard and incapable of permanently retaining sand or sand and/or colouring matter, so far as we are aware, by any process other than that hereinafter described.

10 Although the process and apparatus appertaining thereto is especially intended for producing sand and/or colour faced bricks of the type above referred to, it will be understood that bricks of a stiff plastic kind can be treated by the same process and apparatus.

15 The invention relates, further, to a preferred apparatus for carrying the process into effect and, also to the finished brick, as an article of manufacture.

20 According to this invention, a brick, building-block or the like is, before being burnt, caused to travel in front of a nozzle or nozzles from which emerges a jet of steam combined with air and sand to which may be added colouring matter, or granulated colouring matter without sand may be used. The steam, being under pressure causes the sand and/or colouring matter to impinge on the surfaces of the brick, whilst admittance of air condenses some of the steam and produces hot vapour which moistens and changes the surface of the brick or the like into a condition which enables the sand and/or colouring matter to be em-

bedded in the surface and therefore be permanently retained therein, and thus produce a superior facing to the brick.

Various apparatus can be employed provided they have the required and properly situated nozzles combined with sources of steam, air, sand and colouring matter and mechanism for carrying the brick in front of the nozzle or nozzles or vice-versa, but apparatus which we prefer to use can be constructed substantially as hereinafter described.

An outer casing has projecting thereinto four suitably situated steam conveying pipes, the respective ends of which enter the base of a preferably conically-shaped mixing chamber having an opening constituting a nozzle.

A sand-conveying pipe enters each mixing chamber, the other end thereof terminating on a ledge and adjacent an opening in a receptacle for sand and/or colouring matter. A sleeve fitted slidably on the end of the pipe can be adjusted towards or away from sand which accumulates about the opening of the receptacle to regulate the quantity of sand and air which enters the pipe by reason of the vacuum caused by the flow of the steam through the mixing chamber.

A pipe which enters each mixing chamber enables a regulated supply of additional air to be admitted if required, and, at the same time, constitutes an outlet for water which may have accumulated after operations have ceased, the pipe also permits of colouring liquid being drawn into the mixing chamber as an alternative method of applying it.

An endless band, running over pulleys, travels through the casing. Bricks placed on the band and suitably spaced are carried in front of two oppositely disposed nozzles so that the sand or sand and/or colouring matter is projected onto the respective ends of the brick. As the bricks proceed each of them is brought

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into contact with a stationary projection in the casing which turns the brick, thus bringing the sides thereof in front of the second pair of oppositely disposed nozzles for treatment.

To facilitate turning of the brick on the band the brick has a pivot on that face of it which is placed on the band, the pivot being situated midway between the end and side edges of the brick and preferably consisting of a semi-spherical protuberance formed during the course of compressing. Alternatively, simple turntables may be secured to the face of the

band to support the bricks.

Alternatively, one steam-pipe entering one mixing chamber having one sand-pipe and one air-pipe and four nozzles may be used.

Dated the 8th day of October, 1932.
JOHN A. JOHNSON,
THE NORBITON POTTERIES AND
BRICKWORKS LIMITED,

HELENA B. TAYLOR,

Director.

N. JOHNSON,

Director.

PROVISIONAL SPECIFICATION.

No. 35,294, A.D. 1932.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of "San Remo", Beverley Road, New Malden, Surrey, of British Nationality, and THE NORBITON POTTERIES AND BRICKWORKS LIMITED, a company organised under the Laws of Great Britain, of Blagdon Road, New Malden, Surrey, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in the apparatus described in the provisional specification relating to our co-pending application for Patent dated the 10th day of October 1932 and numbered 28,159.

In our aforesaid provisional specification is described an apparatus comprising an encasement through which a conveyor belt is adapted to carry bricks, building-blocks, slabs and the like before they are burnt and especially of the type known commercially as "semi-dry", in front of suitably disposed nozzles from which steam, sand and air, or steam, sand, air, and colouring matter or steam air and colouring matter are projected onto surfaces of the bricks and the like before they emerge from the encasement.

It has been found, in practice, that the openings through which the bricks and the like enter and leave the encasement permit a considerable quantity of vapour and sand to escape, thereby wasting sand which could be again used, and effecting discomfort to workmen who may be near the apparatus.

In order, therefore, to prevent the escape of vapour and sand, a small extension or enclosure is provided at each end of the encasement, the end wall of each enclosure having an opening coinciding

with an adjacent opening in the end wall of the encasement. Each of the aligned openings have doors or flexible closures which can be raised by the impact of a brick or the like passing through the openings and will automatically close, the arrangement being such that one door of an enclosure closes before the adjacent door opens. Any escape of vapour from the encasement into the enclosures, whilst the inner doors are open, can escape through a flue situated at the top of each enclosure. The doors may consist of flexible sheets of material, such as leather, depending from the upper parts of the openings.

Further, it has been found that sand will accumulate on the upper surface of the lower strand of the conveyor belt and thereby be drawn in between the belt and the surfaces of the pulleys and cause abrasion. In order to prevent such accumulation of sand a protecting plate is provided and is secured to the support which is situated below the upper strand of the belt to prevent sagging thereof. The plate extends between the outer end walls of the extensions of the main casing and may consist of a length of sheet iron bent longitudinally into approximate V-formation. The plate is arranged in such manner that its edges depend below the lower strand of the belt and divert falling sand to each side of it.

Whilst any suitable mixing chamber for the steam, sand, air and/or colouring matter or steam, air and granulated colouring matter, such as that described in our former specification may be employed we now prefer to use a mixing chamber comprising a rectangular hollow

unit into one side of which the steam-pipe enters and extends across the interior to a point adjacent a corresponding outlet which is fitted with an outwardly projecting and removable nozzle. The sand-conveying pipe enters the top of the unit and the drain-pipe extends from the bottom thereof.

Dated the 9th day of December, 1932.

JOHN ALEXANDER JOHNSON,
THE NORBITON POTTERIES AND
BRICKWORKS LIMITED,

N. JOHNSON,
HELENA B. TAYLOR,

Directors.

COMPLETE SPECIFICATION.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of
10 "San Remo", Beverley Road, New
Malden, Surrey, of British Nationality,
and THE NORBITON POTTERIES AND
BRICKWORKS LIMITED, a company organ-
ised under the Laws of Great Britain, of
15 Blagdon Road, New Malden, Surrey, do
hereby declare the nature of this inven-
tion and in what manner the same is to
be performed, to be particularly described
and ascertained in and by the following
20 statement:—

It has heretofore been proposed to apply
granulated substances such as sand to the
surfaces of bricks and the like to impart
to them a soft, warm and rustic appear-
25 ance, but so far as we have been able to
ascertain, the practice has been confined
to bricks and the like of a type com-
monly known as "plastic bricks".

Machines have been proposed for effect-
30 ing the process of veneering the clay from
which bricks are subsequently cut or
moulded and comprise a hopper or recep-
tacle to contain the sand, conduits to con-
vey the sand to mixing chambers or junc-
35 tures with steam-conveying pipes and
thence to nozzles which are suitably
situated to project the combined steam
and granulated substance forcibly onto
one or more surfaces of a previously
40 moulded body of clay and travelling on a
conveyor belt in front of the nozzles. In
one instance of which we are aware, it
has been proposed to provide a veneering
machine with a shield having a ventilat-
45 ing shaft.

It has also been proposed to project
colouring substances onto the plastic clay
subsequently to the veneering process by
means of steam under pressure.

50 This invention is confined to bricks of
the type commercially known as "semi-
dry" bricks which are manufactured
from substances which are almost devoid
of moisture and are so highly compressed
55 that they are extremely dry and their sur-
faces too hard to permit of impregnation
of sand or the like by steam under pres-

sure without the addition of a large quan-
tity of moisture which, according to this
invention, is heated by the admixture
thereof with the steam and simultane- 60
ously projected therewith onto the brick
to temporarily soften its surfaces during
the impingement thereon of the sand.

According to this invention, the re- 65
quired quantity of heated moisture is
produced either by admitting air to the
combined steam and sand so as to con-
dense some of the steam into vapour, or
by admitting water or liquid dye to the 70
combined steam and sand in addition to
air according to requirement, the mixing
devices being specially constructed to
produce the necessary commingling.

This invention comprises, further, the 75
admixture with the sand of granulated
colouring substances to be applied to the
brick simultaneously with the sand and
air or sand, air and water before the sur-
faces dry and harden. 80

Reference being had to the drawings
herewith:—

Fig. 1 is a side view of the entire
apparatus, the front side enclosing wall
having been removed. 85

Fig. 2 is a plan, partly in section, the
section being taken on the line *xx* of
Fig. 1.

Fig. 3 is an end view of Fig. 1.

Fig. 4 is an enlarged side view of a 90
fitting constituting a mixing device for
steam, sand, air and colouring matter if
used and having a nozzle attached thereto.

Fig. 5 shows part of an endless belt
and means which can be used for facili- 95
tating turning of the bricks or the like.

Fig. 6 is a cross section of the belt on
the line *yy* of Fig. 5.

Fig. 7 shows a brick particularly
adapted for treatment in the manner 100
herein described.

On a suitable base 1 is an encasement
2 comprising uprights 3 and side and end
walls 4, 5, each of the side walls having
openings 6, 7, 8, 9, 10, 11, the openings 105
6 to 9 permitting inspection of the in-

terior of the encasement. The openings 8 and 9 are preferably fitted with closures 12.

Extensions 13, 14, of the encasement 5 each have a flue 15 and openings 16, 17, opposite openings 18, 19, in the main part of the encasement. These openings have swinging doors or flexible closures 20, 21, 22, 23.

10 Pulleys 24 on shafts 25 which are jour-
nalled and supported in brackets 26 carry
an endless band 27 passing through the
openings 16, 17, 18, 19, and openings 28
in the end walls of the encasement, the
15 upper strand of the band travelling over
a support 29 to prevent sagging thereof.
An inverted substantially V-shaped shield
29a is secured to the support 29 in such
manner that its edges extend below the
20 lower strand of the conveyor belt, the
shield extending between the outer walls
of the extensions 13-14. One of the
shafts 25 may be driven by any suitable
means.

25 A projection 30 on one of the walls of
the encasement extends slightly beyond
and over one edge of the belt.

Four steam conveying pipes 31 each
project into a fitting 32, there being a
30 suitable removable nozzle 33 in alignment
with the steam-pipe. A sand conveying
pipe 34 which enters the upper part of
each fitting extends upwardly through
and to the upper surface of a horizontally
35 disposed partition 35, the end of the pipe
being fitted with an adjustable sleeve 36.
A pipe 37 fitted with a cock 38 enters the
lower part of the fitting 32 and has an
open end. The fitting may have open-
40 ings 39 to admit air. The nozzle 33 pro-
jecting from each of two of the fittings
32 enter directly into the encasement 2
through the openings 11 at one end there-
of, but at the other end of the encasement
45 the fittings are connected with the interior
thereof by a hollow flaring attachment 40
entering the openings 11.

A receptacle 41 is situated in the
upper part of the encasement and has
50 sloping sides 42 which cause sand in the
receptacle to flow towards openings 43,
44, through which the sand falls and
forms heaps on the partition 35 and adja-
cent the sleeves 36 on the sand-pipes.

55 Various means may be devised for
facilitating turning of a brick or the like
on the belt and the preferred means con-
sists in forming a rounded or semi-
spherical projection 45 on one of the sur-
60 faces 46 of a brick, the projection consti-
tuting a pivot and, at the same time,
raises the surface 46 from close contact
with the belt when placed thereon with
said surface downwards.

65 Alternative means may consist of any

suitably constructed turn-tables. Such
turn-tables might each consist, for ex-
ample, of a steel disc 47 secured to the
surface of the belt, and having a disc 48
revolvably pivoted thereon.

Initially, sand and/or granulated
70 colouring matter is deposited in the re-
ceptacle 41 from which it falls through
the openings 43, 44, and forms small heaps
on the partition 35.

75 Bricks or the like to be treated are
placed on the conveyor belt at A and pass
through the opening 16 thereby raising
the door or flexible closure 20 which
closes before the adjacent closure 21 is
80 raised thereby preventing prolonged escape
of vapour. Any vapour which may have
escaped into the extensions 14 escapes
through the flues 15. As the brick passes
the first oppositely disposed nozzles 33 a
85 mixture of combined steam, air and sand
and, if desired, colouring matter is pro-
jected on to their respective ends.
Instead of adding granulated colouring
matter as described, liquid dye can be
90 drawn in through the pipe 37 which may
also be used for admitting a supply of
air in addition to that which enters the
pipe 34 with the sand and also through
the openings 39. The supply of air or
95 dye can be regulated by the cock 38. As
a brick is carried along, one end of it
comes into contact with the projection 30
and is thereby turned about so as to
100 present its respective sides to the second
pair of nozzles from which they receive
treatment as before described with refer-
ence to the first pair of nozzles. Inas-
much as it is essential that the nozzles
105 be disposed at a suitable distance from
the surfaces of the brick which are under
treatment, those nozzles which operate on
the ends of the brick are removed a greater
distance therefrom than those which pro-
110 ject a spray on to the sides of the brick
this provision being effected by the attach-
ments 40. The brick then passes on
through the openings 19, 17, the flexible
closures 19, 23, operating as described
115 with reference to the doors 20, 21.

The quantity of sand to be used can
be regulated by moving the sleeves 36, on
the sand conveying pipes 34, nearer to-
wards or away from the sand heaps, and
the accumulation of sand which does not
120 adhere to the bricks can be periodically
removed through any suitable opening in
the lower part of the encasement. Water,
due to condensation after working has
ceased, can be drained off through the
125 pipe 37.

The shields 29a prevent the falling
sand from depositing on the lower strand
of the conveyor belt and being thereby
130 carried between it and the surfaces of the

pulleys and setting up abrasion.

Inasmuch as bricks and the like will sometimes crack, on one or more surfaces after treatment such bricks or the like may be rendered unfit for use when only one or two surfaces thereof have been treated. Therefore the advantage of having four of the surfaces treated in the manner described will be appreciated.

10 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

15 1. A process of treating the surfaces of bricks, building-blocks and the like of the type commercially known as "semi-dry" by subjecting said surfaces to an impingement of steam sand and air, or steam sand air and water before the bricks are burnt.

2. The addition of colouring matter to the sand for projection therewith onto the bricks or the like according to the process claimed in claiming clause 1.

25 3. The addition of liquid dye to the admixture of steam sand and air used in the process according to claim 1.

30 4. Apparatus when used for effecting the process according to claim 1 comprising mixing devices which are such that they will mix steam sand and air or steam sand air and water or liquid dye and are fitted with nozzles from which the admix-
35 tures are projected.

5. Apparatus when used for effecting the process according to claim 1 comprising an encasement having a receptacle for sand or sand and colouring matter, com-
40 bined with a horizontally disposed partition onto which the sand gravitates and from which it is drawn for use: extensions of the encasement each having an opening corresponding to one of two openings in
45 the encasement and swinging or flexible doors in the respective openings in the encasement and extensions thereof; a conveyor belt adapted to travel through the encasement and having a support beneath

the upper strand of the belt: a shield se-
cured to the support to protect the belt
from sand: steam, sand and air conveying
pipes: means for effecting admixture of
steam sand and air or steam sand air and
colouring matter: means for admitting
liquid dye to the mixing device: and
means for turning a brick, building-block
or the like on the conveyor belt.

6. Apparatus according to claims 4 and
5 in which means for regulating the
quantity of sand or combined sand and
air to the mixing device consists of a
sleeve slidable over and adjustable on the
intake end of the sand conveying pipe
and adapted to operate as described.

7. Apparatus according to claims 4 and
5 having means whereby liquid dye can
be alternatively used according to claim
3 in the manner described.

8. A brick, building-block or the like
of the type known as "semi-dry" of
which surfaces have been treated by a
process according to claims 1 to 3.

9. A brick, building-block or the like,
known as "semi-dry" according to claim
8, of which four of its surfaces have been
treated according to claims 1, 2, or 3.

10. A brick, building-block or the like
having an approximate semi-spherical
projection on one of its faces to enable
its surfaces to be treated according to
claim 9 and by apparatus according to
claims 4 and 5.

11. The process of treating the surfaces
of bricks, building-blocks or the like of
the type known as "semi-dry" substan-
tially as herein before described.

12. Apparatus when used for effecting
the process claimed in claims 1 to 3, as
herein before described and illustrated in
the accompanying drawings.

Dated this 9th day of December, 1932.
JOHN ALEXANDER JOHNSON,
THE NORBITON POTTERIES AND
BRICKWORKS LIMITED,

N. JOHNSON,
HELENA B. TAYLOR,

Directors.

[This Drawing is a reproduction of the Original on a reduced scale.]





